

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-37 are pending in the present application. Claims 1-12, 14-18, and 23 have been amended by the present amendment without adding new matter. Claims 35-37 have been withdrawn.

In the outstanding Office Action, Claims 1-34 were rejected under 35 U.S.C. § 112, second paragraph; Claims 1-3, 5, 8, 9, 14, 15, 18, 20, 23, 31, and 32 were rejected under 35 U.S.C. § 102(a) as anticipated by Sawada et al. (Japanese Patent Publication No. 11-77842 A, herein "Sawada"); Claims 4, 6, 7, 10-13, 16, 17, 19, 21, 24-30, 33, and 34 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sawada; and the outstanding Office Action requested that Applicants provide a translation of pertinent parts of Sawada.

The specification has been amended to substitute the term "injection" for the term "ejection." No new matter is believed to be added.

Regarding the request of the outstanding Office Action to provide a translation of pertinent parts of Sawada, a machine translation of Sawada is filed with an Information Disclosure Statement (IDS) together with the present amendment.

Regarding the rejection of Claims 1-34 under 35 U.S.C. § 112, second paragraph, Claims 1-12, 14-18, and 23 have been amended to omit the term "naturally," to substitute the term "injection" for the term "ejection," to more clearly define the language "with priority," and to clarify that an optical surface is configured to receive and/or output light. As described in the specification, at page 22, lines 5-12, the optical surface of an optical element (such as a lens) is the surface through which the light is received (input) or output. In addition, Claim 1 has been amended to recite steps for forming a plastic optical element.

Further, Applicants respectfully submit that Claims 1-34 clearly define the present invention. More specifically, Claim 1 recites “cooling the optical surface of the plastic optical element,” and dependent Claim 3 recites annealing at least a portion of a surface of the plastic optical element other than the optical surface. This claim is broad as to how annealing is accomplished as it does not specify contact or non-contact as to the annealing, but breadth cannot be equated to indefiniteness. See *In re Miller*, 169 USPQ 597 (CCPA 1971). Dependent Claim 4, which depends from Claim 3, recites that the annealing is achieved by contacting the lens with a temperature control member, and dependent Claims 6 and 7, which indirectly depend from Claim 3, recite that the annealing is achieved by non-contacting the lens with a heating apparatus. As Claim 3 does not restrict how annealing is accomplished, Claim 4 and Claims 6 and 7 can all be dependent thereon. Independent Claim 23 recites similar features as independent Claim 1.

Thus, Applicants respectfully submit that Claims 1-34 clearly recite the features of the present invention.

Furthermore, independent Claim 18 recites annealing a surface of the optical element other than the optical surface, and the recited annealing may employ a “contacting” temperature control of Claim 19 or a “non-contacting” temperature control as in Claim 21. Again, the breadth of Claim 18 cannot be equated to indefiniteness. Thus the mere fact that dependent Claim 19 recites the “contacting” temperature control with respect to the surface other than the optical surface of the optical element while dependent Claim 21 recites the “non-contacting” temperature control (non-contacting heating apparatus) with respect to surfaces other than the optical surface of the optical element cannot be said to render broader independent Claim 18 indefinite.

Regarding the relation of an optical surface and surfaces other than the optical surface of the optical element, independent Claims 1, 18, and 23 have been amended to more clearly define the optical surface. Further, both Claims 1 and 8 recite cooling the optical surface of the plastic optical element, and Claims 2 and 3 recite annealing a portion of a surface of the plastic optical element other than the optical surface. Accordingly, Applicants respectfully submit that the relation between cooling the optical surface and annealing surfaces other than the optical surface of the plastic optical element are definite under 35 U.S.C. § 112, second paragraph.

Referring to the rejected language “with priority in a state” of Claim 1, Claim 1 has been amended to recite “the optical surface of the plastic optical element” is cooled to a room temperature “with priority over other surfaces of the plastic optical element.” Further, Applicants respectfully submit that “an annealing” is recited in Claim 2 and not in Claim 1.

Therefore, Applicants respectfully submit that independent Claims 1, 18, and 23 and each of the claims depending therefrom is definite under 35 U.S.C. § 112, second paragraph, which only require that the artisan would understand the claim language when considering it in light of the specification. See MPEP § 2173.02.

Claims 1-3, 5, 8, 9, 14, 15, 18, 20, 23, 31, and 32 were rejected under 35 U.S.C. § 102(a) as anticipated by Sawada. That rejection is respectfully traversed.

Briefly recapitulating, Claim 1 is directed to a plastic optical element producing method that includes injecting a melted resin material into a mold, removing a plastic optical element from the mold, and cooling the optical element to a room temperature by cooling an optical surface of the plastic optical element with priority over other surfaces of the plastic optical element. The optical surface receives and/or outputs light. Independent Claim 23 has been amended to recite similar features as independent Claim 1.

In a non-limiting example, Figure 3 shows the plastic optical element 1, the optical surface 11, and the other surfaces 12 of the plastic optical element 1.

As disclosed in the specification at page 22, line 20, to page 24, line 11, the optical element 1 (see Figure 3) is placed next to a temperature control member 21 such that the temperature control member 21 controls a temperature of the other surfaces of the plastic optical element and not a temperature of the optical surface of the plastic optical element. Thus, the optical surface 11 of the plastic optical element lens 1 exchanges heat with the environment while the other surfaces 12 of the plastic optical element 1 exchange heat with the temperature control member 21. Therefore, the optical surface 11 is cooled with priority over the other surfaces 12 of the plastic optical element 1, as disclosed in the specification at page 24, lines 2-11.

The present invention advantageously achieves a temperature distribution of a refractive index “in a light transmitting direction in which the light is transmitted through the scanning lens.”¹

Turning to the applied art, Sawada shows in Figures 2 and 4 a mold device PF and lenses Op1 formed by the mold device PF. Further, Sawada discloses in paragraph [0044] that lenses Op1 are placed on an annealer PA, and the lenses are annealed such that both the optical surface and other surfaces different than the optical surface are cooled without a priority of one over the other. In other words, Sawada merely proposes a method of holding an optical element for a predetermined time within a predetermined temperature range, and carrying out a cooling process to reduce the refractive index distribution. However, the optical element of Sawada is heated and cooled in its entirety, and the annealing is carried out

¹ Specification, page 24, lines 12-25.

without making the optical element have a particular temperature distribution, as required by Claims 1 and 23.

Therefore, Sawada does not teach or suggest cooling an optical surface of a plastic optical element with priority over other surfaces of the plastic optical element, as recited in amended Claims 1 and 23. Accordingly, it is respectfully submitted that independent Claims 1 and 23 and each of the claims depending therefrom patentably distinguish over Sawada.

Independent Claim 18 recites a plastic optical element apparatus having at least one temperature control member. The at least one temperature control member contacts at least a portion of a surface of the plastic optical element other than an optical surface and the at least a portion of a surface excludes the optical surface. However, Sawada does not teach or suggest that a temperature control member contacts at least a portion of a surface of the plastic optical element, which excludes the optical surface. Sawada does not teach or suggest a preferred position of a lens in the annealer PA.

Accordingly, it is respectfully submitted that independent Claim 18 and each of the claims depending therefrom patentably distinguish over Sawada.

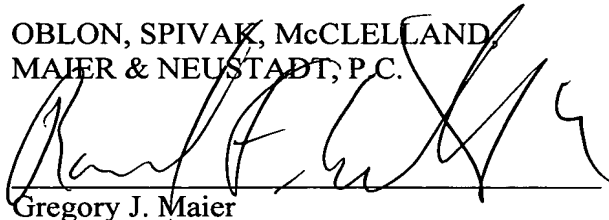
Claims 4, 6, 7, 10-13, 16, 17, 19, 21, 24-30, 33, and 34 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sawada. That rejection is respectfully traversed.

Claims 4, 6, 7, 10-13, 16, 17, 19, 21, 24-30, 33, and 34 depend directly or indirectly from independent Claims 1, 18, and 23, which are believed to be allowable as noted above. Accordingly, it is respectfully submitted that dependent claims 4, 6, 7, 10-13, 16, 17, 19, 21, 24-30, 33, and 34 are also allowable.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Gregory J. Maier', is written over a horizontal line.

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